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OPERATING MANUAL LOOM CONTROLLER

LCW 2.08C

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LOOM CONTROLLER LCW 2.08C

GENERAL - The circular Loom is an important machine in plastic and Textile industry. The quality and quantity of the final product largely depends on these machines, hence it becomes absolutely necessary to monitor and control certain parameters around the clock. Our Loom controller just serve this purpose. The Loom controller monitors some parameters of the Loom and controls the mesh size of the final product. The mesh control is so precise that even during weft breakage cramming is totally avoided, resulting in zero defect fabric. The loom controller uses proportionate driving during weft breakage .Separate loom monitor can be fitted on the loom along with loom controller to monitor all other parameter like production, number of weft breakages, number of warp breakages, weft delay, warp delay, efficiency etc.

SYSTEM DESCRIPTION – The Complete system comprises of following.

1. **Take up drive** - A 3 Phase 0.5 / 1 Hp Induction motor (worm geared) with final shaft RPM of 10 -15 is required for the take up. This motor can be mounted just near the take up roll and take up roll is driven directly from the Geared motor shaft by a suitable chain sprocket arrangement. This will remove existing chain drive from the main shaft of motor and cramming device (Clutch).
2. **Motor Drive**- Variable frequency drive 0.4/0.8 kW with 440 Volt input (Or if 230 volt motor is used , a 230 Volt input drive can be used) required for driving above motor. This drive is responsible for rotating the motor at the calculated speed decided by Loom Controller . This will control the mesh size and the cramming in case of weft tape beak. The AC drive should be able to operate from external 0-10 volt dc, which will be generated by the Loom controller.
3. **Loom Controller** – The function of the controller is to get pulses from rotation of the loom and rotate the take up roll as per the weft density and loom rpm. In the event of weft break the take up speed is so adjusted that there is no cramming or gap in the fabric, resulting in zero defect fabric.
4. **Proximity Switch** - This is a PNP type proximity switch mount near the main shaft of Loom. A suitable gear will be required to be mounted on main shaft of motor. The proximity switch will be mounted close to this gear. This proximity switch will produce fix number of pulses per rotation of the Loom.

CONTROLLER- The loom controller is housed in extruded aluminum box. On the front there is a large LCD 2x16 character display and keypad with 4 keys. On the back side there is a 15 pin 'D' connector for terminating various signal, LED to indicate the signal status , key switch to lock the parameters and a protection fuse. The heart of the controller is a Signal Chip Micro-controller.

The controller also has Real Time Clock with memory, which will retain the data in the event of power failure. The input signal to the controller are optically isolated to ensure adequate protection in controller from external disturbance, The LCD display is back lit to facilitate the easy reading in the night also. The input power supply to controller is 24 volt AC that is easily available in Loom control panel.



INSTALLATION – The loom controller along with AC drive can be installed in main panel or a separate panel. Following connection are to be terminated on back connector.

Description	15 pin D- type (M) connector
24 VAC Supply	13,14 Red , Orange
Output Signal 0-10V DC, To AC Drive speed control	1 +ve Light Green , 2 -GND Dark Green
Output Signal 0-10V DC, To AC Drive speed control	3 +ve Blue , 4 – GND Black
Inch On Signal	8,10 Pink , Brown
Weft Break Signal	8,9 Voilet , Grey
Loom On Signal	8,11 White , Yellow
3-Pin Connector For Proximity Switch	1 – 0 VDC Black , 2- Signal Green 3 - + 24VDC Red

Before switching on power supply to controller please check following:

1. Rotate the Loom with inching only and check if pulses from proximity switch are coming on the LED at the back panel of Loom controller. If the proximity switch miss any pulse due to mechanical alignment then mesh size will vary . Proximity switch should be fitted so securely and accurately that it will never miss even a signal pulse.
2. Switch on power to the AC drive and check if it works in manual mode and take up motor rotates slowly.
3. Now switch on the 24 VAC supplies to Loom controller.

KEY FUNCTION – The loom controller has a large two line 16 character LCD display and 4-switches on the front panel. The functions of these switches is as given below.

↑ The UP key will move the display up by one parameter. This key is also used when any parameter is to be changed (see below). By pressing this key along with C key the value of parameter will increase. (Password setting is required for master reset.)

↓ The DOWN key will move the display down by one parameter. This key is also used when any parameter is to be changed (see below). By pressing this key along with C key the value of parameter will decrease.
(Password setting is required for master reset.)

The 'C' key is used for changing the value of parameters along with arrow keys. Please note that this key will only work if proper key is inserted in mechanical key switch provided at the back.

The 'R' key to reset all the parameter press C and R simultaneously and then apply 24 Volt AC power supply to controller.

SETTINGS - The loom controller has following setting and should be done only after understanding the function.

The display will show number of parameters, which are explained as follow :-



- 0 **Weft Density** - The weft density will control mesh size of the fabric. It is indicated as number of tapes per inch. The value can be changed from 3 Tapes/Inch to 20.0 Tape /inch
1. **Weft Density** - The weft density will control mesh size of the fabric. It is indicated as number of tapes per 100mm. The value can be changed from 12.0 Tapes/100mm to 80.0 Tape /100mm
2. **Shuttle 4, 6, 8, 10** – Enter the number of shuttles of your loom. The Loom RPM parameter will display actual RPM of the loom, based on the shuttle.
- 3 **Pulses Per shuttle** –This is number of pulses generated by proximity switch per shuttle. Calculate the pulses per revolution of loom and divide it by number of shuttles.
- 4 **Cram Pitch** – This is used along with parameter no 5 and 6 (below) to set the cramming of fabric at fixed spacing. Cram pitch is the fixed spacing in number of tapes after which cramming will occur for the number of tapes as specified in cram length. The amount of cramming in % is specified as Cram Density.
- 5 **Cram Length** - This parameter will decide the length (i.e. number of tapes) of cramming at fixed spacing of Cram Pitch.
- 6 **Cram Density** - This parameter will decide the cram density at fixed spacing. 100% means no cramming. 50% means specified number of tapes crammed in to 50% of space.
7. **Start Acceleration**- This parameter can be set from 49% to 400% of current fabric speed (Insert rate). No effect on 100%. Increase this value if there is cramming or decrease if there during start cycle.
8. **Start Acceleration Limit** – This parameter can be set from 8 Tp/Inch rate up to 999 Tp /Inch insert rate. For Start Acceleration you can set limit in insert rate. Thus start Acceleration will be active up to set insert rate only. Above which this setting will not be active.
9. **Weft De- Acceleration** – This parameter can be set from 9% to 110% of current fabric speed. No effect on 100% Increase this value if there is cramming or decrease if there is gap during weft break . Set the parameter to suitable value to avoid gap while weft breakage .
10. **Stop De-acceleration** – This parameter can be set from 10 % to 110 % of current fabric speed . No effect on 100 % . Increase this value if there is cramming or decrease if there is gap during stop cycle.
11. **Stop De-Acceleration Limit** – This parameter can be set from 8 Tp/ min insert rate to 1008 Tp/min insert rate. For stop De- Acceleration you can set limit in insert rate Thus stop De-Acceleration will be active up to set insert rate only . Below which this setting will not be active . Below this insert rate the output will drop to 0.



12. **Inch Acceleration** – This parameter can be set from 49% to 400 % No effect on 100%.
13. **Inch Acceleration Limit** – This parameter can be set from 8 Tp/min insert rate to 201 Tp/min insert rate. No effect on 100% For inch acceleration set limit in insert rate .Thus Inch acceleration will be active up to set insert rate only. Above which this setting will not be active.
14. **P Gain** – P gain is final gain of digital to analog converter. If the set weft density and actual weft density does not match, set the P gain accordingly.
15. **Password** – For changing any parameter setting ,the password must be set to 225 and then parameters setting can be changed, 60 seconds (1 minute) after any last change, the password will reset to "0" (disable) . To change any parameter setting again, repeat above procedure.
Key switch is not provided (not used if already provided) in LCW 2.06C version.
(Password setting is required for master reset.)
16. **Loom RPM** – This parameter indicates instantaneous RPM of the loom.
17. **Insert Rate** – This will indicate the insert rate in picks (Tapes) / minute of the loom.
18. **Production Rate-** This parameter indicate instantaneous production rate of the fabric in mtr/min . The controller should be exactly calibrated i.e. set weft density on loom controller should be exactly equal to actual weft density of the fabric produce.

NOTE-

- We can provide separate 'Loom On' potentially free NO contact (Run mode by pressing START push button) & 'Inch' potentially free NO contact (Inch mode by Inch push button), so that separate setting of Start Acceleration and Inch Acceleration can be made. But if you do not want to use Inch Acceleration at all, then do not contact to it and only Start Acceleration can be used . In this case Inch on signal must be given to Loom On signal . Here we have incorporated insert Rate limits to Start Acceleration , Inch Acceleration and Stop De- Acceleration .
- For start Acceleration and Inch acceleration you can set limit in insert Rate. Thus this acceleration will be active up to set Insert Rate only. Above which this setting will not be active.
- For stop De-Acceleration as soon as Loom stop push button is pressed or if Loom stops due to any reason then Stop De-Acceleration will be immediately active. It will remain active till actual insert Rate is above set limit. Below this insert rate limit, stop De-Acceleration will not be active. Out put will be 0 below this limit.
- Since Stop Acceleration limit is adjustable down up to 8 picks , it will be in inching operation . While 'Inch on', Inch Acceleration will be active but when inch button is released then Stop De-Acceleration will be active as neither 'Inch On' nor 'Loom On' (Run) signal is present.



- P Gain – The parameters P GAIN is provided for calibration . This calibration is done to set weft density on loom controller exactly equal to actual weft density (Mesh Size) measured . This calibration is done once only while installation . Increase the parameter value to speed up & decrease the value to speed down take up drive.
- Pot 502 (5k) is provided for "0" setting of amplifier and it is set at factory. Do not disturb the pot setting. This pot is provided to set analog out put To 0v (less than 10 mv),when proximity pulses are not coming.
- Cramming :- For example if you want to set cramming of 1 inch at the interval of 20 inches along the length fabric spacing with 50% cramming and weft density is set to 10TP/in, then set Cram Pitch to 200 tapes, Cram Length to 20 tapes and Cram Density to 50%.For disabling this feature set Cram Length to 0. When Cram Density is changed from 100% to any other value, then recycle the 24 V Ac power supply to loom controller. after power on, the new value will be active.

PARAMETER LIST—This the parameter list programmed in the controller . The list shows the parameter name , unit , maximum value , minimum value,

PARAMETER NAME	UNIT	MIN VALUE	MAX VALUE	NO EFFECT	AFTER M/R
Weft Density	Tp/Inch	3	20.0		10
Weft Density	Tp/100 mm	12.0	80.0		40.0
Shuttles	NO	4	10		6
Pulse per shuttle	NO	8	64		32
Cram Pitch	Tp	300	2000		500
Cram Length	Tp	000	200		000
Cram Density	%	009	151%	100%	100
Start Accln.	%	49%	400%	100%	100
Start Accln. Limit	Pick/Min	008	999		192
Weft De-Accin.	%	9%	110%	100%	100
Stop De-Accln	%	9%	110%	100%	100
Stop De-Acceln. Limit	Pick/Min	008	1008		16
Inch Acceln	%	49%	400%	100%	100
Inch Accln. Limit	Pick/Min	008	408		192
P gain	X factor	10.0	100.0		26.6



INSTALLATION – The loom controller along with AC drive can be installed in main panel or a separate panel also. Following connection are to be terminated on back connector (at the backside).

Description	15 pin D- type (M) connector
24 VAC Supply	13,14 Red , Red
Output Signal 0-10V DC, To AC Drive speed control	3 +ve Blue , 4 – GND Black
Inch On Signal	8,10 Brown , Brown
Weft Break Signal	8,9 Grey , Grey
Loom On Signal	8,11 Blue , Blue
3-Pin Connector For Proximity Switch	1 – 0 VDC Black , 2- Signal Green 3 - + 24VDC Red

Before switching on power supply to controller please check following:

4. Rotate the Loom with inching only and check if pulses from proximity switch are coming on the LED at the back panel of Loom controller. If the proximity switch miss any pulse due to mechanical alignment then mesh size will vary . Proximity switch should be fitted so securely and accurately that it will never miss even a signal pulse.
5. Switch on power to the AC drive and check if works in manual mode and take motor rotates slowly.
6. Now switch on the 24 VAC supplies to Loom controller. (+/- 3 V AC)

SETTINGS - The loom controller has following setting and should be done only after understanding the function.

1. Out put signal pot – This trim pot (a hole for adjustment on the top side of box) is required for calibration. This calibration is done to set weft density on loom controller exactly equal to actual weft density (Mesh Size) measured. This calibration is done once only while installation. Increase the pot (clockwise) to speed down & decrease the pot (anticlockwise) to speed up.

FUNCTION – The loom controller has a large two line 16 character LCD display and 4-membrane type switches on the front panel. The functions of these switches is as given below.

- ↑ The key will move the display up by one parameter. This key is also used when any parameter is to be changed (see below). By pressing this key along with C key the value of parameter will increase.
- ↓ The key will move the display down by one parameter. This key is also used when any parameter is to be changed (see below). By pressing this key along with C key the value of parameter will decrease.



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